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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,366	10/20/2003	Mark Beaumont	DB001071-000	4384
24122	7590	03/29/2006	EXAMINER	
THORP REED & ARMSTRONG, LLP ONE OXFORD CENTRE 301 GRANT STREET, 14TH FLOOR PITTSBURGH, PA 15219-1425			CODY, DILLON J	
			ART UNIT	PAPER NUMBER
			2183	

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,366

Applicant(s)

BEAUMONT, MARK

Examiner

Dillon Cody

Art Unit

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-13, 16-22 and 28 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 14, 15 and 23-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/20/03, 1/7/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-28 are pending.

Papers Filed

2. Examiner acknowledges receipt of claims, disclosure, drawings, declaration, preliminary amendment, and information disclosure statement, all filed 20 October 2003; information disclosure statement filed 7 January 2004; preliminary amendment filed 12 October 2004.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Great Britain on 23 April 2003. It is noted, however, that applicant has not filed a certified copy of the "0309195.6" application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

4. The information disclosure statement filed 20 October 2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but information referred to therein has not been considered. Citations to

"International Conference on Supercomputing" and "International Conference on Parallel and Distributed Processing Techniques and Applications" were not received.

Title

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

6. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 2, 5 and 6A-10B contain text which is unreadable.

Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

7. The abstract of the disclosure is objected to because:

Line 1: "the reflection" should read "a reflection" as an array may be reflected about either the X or Y axis.

Lines 8 and 13: MOD is an operation requiring two inputs. Hence, the expressions in these rows should not contain the multiply ("x") immediately preceding "Mod" and instead should read "(2 x ____ Index) Mod (array_size)".

Correction is required. See MPEP § 608.01(b).

8. The disclosure is objected to because of the following informalities:

Page 3 lines 18 and 22: MOD is an operation requiring two inputs.

Hence, the expressions in these rows should not contain the multiply ("x") immediately preceding "Mod" and instead should read "(2 x ____Index) Mod (array_size)". All subsequent occurrences should also be corrected.

Appropriate correction is required.

Claim Objections

9. Claims are objected to because of the following informalities:

Claims 1 and 12, line 1: "the reflection" should read "a reflection" as an array may be reflected about either the X or Y axis.

Claims 3, 4, 14, 15 and 23: MOD is an operation requiring two inputs. Hence, the expressions in these rows should not contain the multiply ("x") immediately preceding "Mod" and instead should read "(2 x Index) MOD (array_size)". Further, the examiner recommends entering MOD fully capitalized, so as to distinguish it as a mathematical operation and to increase enforceability of any resulting US Patent.

Claims 3, 4, 14, 15 and 23: Col_Index, Row_Index and array size are all undefined terms. Examiner requests that definitions of the terms be added to the claims.

Claim 16: Claim 16 appears to depend from claim 13 rather than from claim 12 as it currently reads. The claim will be interpreted as such.

Claim 27: Claim 27 appears to depend on claim 26 rather than on claim 25 as it currently reads. The claim will be interpreted as such.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 11 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims recite shifting data along rows and shifting data along columns. The specification is silent as to an operation performing **both** a shift along rows and columns to achieve a matrix reflection. For purposes of examination, the examiner will interpret the claims to read "shifting data west to east and east to west along rows, or [[and]] includes shifting data north to south and south to north along columns".

Claim Rejections - 35 USC § 101

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13. Claim 28 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The memory device which this claim is directed toward is not limited to a tangible product. For instance, a piece of paper containing instructions reads on the claim in its current state. The examiner recommends amending claim language to read "Computer readable storage medium."

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1, 2, 5, 10-13, 16, 21, 22 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor (U.S. Patent No. 4,992,933).

16. As per claim 1, Taylor teaches a method for generating [a] reflection of data in a plurality of processing elements, comprising:

shifting the data along either the rows or columns of the plurality of processing elements (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) until the processing elements in the rows or columns have received the data held by every other processing element in that row or column, respectively; *The examiner asserts that every processing element in the matrix receives data as it is being shifted from a different processing element. Collectively, every element receives data held by every element.*

selecting data as a final output based on a processing element's position. The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.

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17. As per claim 12, Taylor teaches a method for generating [a] reflection of data in an array of processing elements, comprising:

shifting the data along either the rows or columns in the array (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) a number of times equal to $N-1$ where N equals the number of processing elements in the rows and columns, respectively; *The examiner asserts that for the case where $N=4$, Taylor's invention performs a total of $N-1$ shifts. For $n=4$, $1+n/2 = n-1$.*

outputting data from each processing element as a function of that element's position in one of the row and column. *The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.*

18. As per claims 2 and 13, Taylor teaches the method of claims 1 and 12 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location, said selecting being responsive to said initial count. *The examiner asserts that the NEWS setting for each processing element sets the shift count to $1+(n/2)$ (Col. 10 line 18). Further, data is made final (output) after the final shift has occurred, which is resultant on the initial count value.*

19. As per claims 5 and 16, Taylor teaches the method of claims 2 and 13 additionally comprising maintaining a current count in each processing element, said

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current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that Taylor's processor inherently keeps track of the shift count as a current count. If no current count was maintained, the processor may never stop shifting data between processing elements.*

20. As per claims 10 and 21, Taylor teaches the method of claims 1 and 12 wherein said shifting includes a wrap shift. *Fig. 7a and 7b disclose shifting occurring where values wrap from one row/column to the row/column on the other side of the array.*

21. As per claims 11 and 22, Taylor teaches the method of claims 10 and 21 wherein said wrap shift includes shifting data west to east and east to west along rows, [or] includes shifting data north to south and south to north along columns. *Fig. 7b discloses data moving east to west along the row and from west to east as it wraps from the far left column to the far right column.*

22. As per claim 28, Taylor teaches a memory device carrying a set of instructions which, when executed, perform a method comprising: shifting the data along either the rows or columns of the plurality of processing elements (Col. 9 line 65 – Col. 10 line 38 and fig. 7a and 7b) until the processing elements in the rows or columns have received all the data held by every other processing element in that row or column, respectively; selecting data as a final output based on a processing element's position. *The examiner*

asserts that every processing element in the matrix receives data as it is being shifted from a different processing element. Collectively, every element receives data held by every element. The examiner asserts that data is output after the final West-shift has occurred and that each processing element outputs data based on its location.

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 6-9 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor.

25. As per claims 6 and 17, Taylor teaches the method of claims 5 and 16 but fails to disclose wherein said maintaining a current count includes altering said initial count at programmable intervals by a programmable amount.

26. Official Notice is taken that decrementing a counter from an initial value for every iteration of a function is well known in the art.

27. Decrementing an initial value provides the benefit of allowing a comparison to a single known value (ie, zero) in lieu of comparing to a second value stored in a register. By comparing to a known value like zero, no additional storage is required to maintain the comparison value.

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28. It would have been obvious to one of ordinary skill in the art at the time of invention to have decremented the initial count value upon each iteration of the shift until the value reached zero.

29. As per claims 7 and 18, Taylor teaches the method of claims 5 and 16 but fails to disclose wherein said initial count is decremented in response to said shifting of data to produce said current count.

30. Official Notice is taken that decrementing a counter from an initial value for every iteration of a function is well known in the art.

31. Decrementing an initial value provides the benefit of allowing a comparison to a single known value (ie, zero) in lieu of comparing to a second value stored in a register. By comparing to a known value like zero, no additional storage is required to maintain the comparison value.

32. It would have been obvious to one of ordinary skill in the art at the time of invention to have decremented the initial count value upon each iteration of the shift until the value reached zero.

33. As per claims 8 and 19, Taylor teaches the method of claims 6 and 18 wherein said selecting occurs when said current count is non-positive. *The examiner asserts that zero is a non-positive value.*

34. As per claims 9 and 20, Taylor teaches the method of claims 1 and 12 additionally comprising maintaining a local count including setting a counter to a first known value. *The examiner asserts that Taylor's processor inherently keeps a shift count for moving data from processing element to processing element. If the count was not maintained, the processor would not know when to stop shifting data.*

35. Taylor fails to disclose counting up from said first known value based on the number of shifts that have been performed, said selecting occurring when a current count equals a target count.

36. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

37. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

38. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored value required by the NEWS setting to ensure the proper number of shifts was performed.

Allowable Subject Matter

39. Claims 3-4 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

40. Claims 23-27 contain allowable subject matter over prior art of record.

41. The following is a statement of reasons for the indication of allowable subject matter: Taylor's processor inherently contains a count value which dictates how data values are shifted from one element to another. Applicant's processor sets count values for each row or column based on the equations given in claims 3-4, 14-15 and 23. No teaching in the prior art of record discloses using such count values to achieve a matrix reflection.

Conclusion

42. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bratt et al. (U.S. Patent No. 6,877,020) disclose performing a matrix transpose by shifting rows and columns a number of times based on the row or column index.

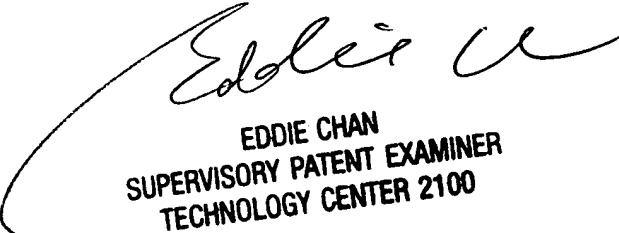
43. The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon Cody whose telephone number is 571-272-8401. The examiner can normally be reached on Mon - Fri, 8 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 571-272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJC



EDDIE CHAN
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